

Role of Plants for Absorption and Removal of Indoor Air Pollutants

It is estimated that we spend around 80–90% of our time in indoors. So, the indoor air we breathe will have a big impact on our current and future health. Poor indoor air has been related to the “sick-building” syndrome, causing ongoing health issues such as nose, throat and eye irritations, cold symptoms, allergies, asthma triggers, and even premature death.

Phytoremediation (pronounced - phy-to-re-me-di-a-tion) is a term built using the Greek *phyto* (plant) and Latin *remedium* (restoring balance) and is the study of using green plants to remove toxic environmental contaminants such as particulate matter (PM₁₋₁₀) and volatile organic compounds (VOC). Research in this field is ongoing with many international papers published over the last 3 decades that shows indoor plants can reduce various indoor air pollutants both reliably and cost effectively. However, the type and number of indoor plants is very important to understand. Plant characteristics, such

as leaf area, number, sunlight intensity, respiration, and photosynthesis, to effectively remove air pollutants can vary between plant species. In general, CO₂ and PM are absorbed through the leaves while VOC's like formaldehyde and benzene are absorbed through the plants' roots. Plants that require high levels of sunshine typically do better at scrubbing the air than do shade plants. So, not all plants are created equal.



List of selected air-purifying house plants.

According to one 2013 study¹ an estimated 57 m² leaf area can remove ~13% of CO₂ per person in an unventilated room where a greater leaf area removes more CO₂. At the same time plants that need higher levels of sunshine remove CO₂ more efficiency² making a broad leaf plant that needs lots of sunshine is the best combination for indoor air use. The figure above lists some of the plants that have demonstrated to be better at removing pollutants. A more complete list can be found on the Air Quality webpage at: <https://winnebagotribe.com/air-quality/>

It is important to remember that indoor plants cannot do the job themselves. They are meant as a supplement to your indoor air quality. Your home ventilation & maintenance, house cleaning, the use of air purifiers carry the biggest effect for your indoor air quality. House plants is just an additional component that can be used increase your indoor air quality.

¹ Kim, K., and Kim, H. (2008). Development of model and calculating equation for rate of volatile formaldehyde removal of indoor plants. *Hortic. Environ. Biotechnol.* 49, 155–161

² Fujii, S., Cha, H., Kagi, N., Miyamura, H., and Kim, Y. S. (2005). Effects on air pollutant removal by plant absorption and adsorption. *Build. Environ.* 40, 105–112. doi: <https://doi.org/10.1016/j.buildenv.2004.04.015>